

**LINEAR PROGRAM-BASED TECHNIQUE FOR PLACING FRR TE TUNNELS
WITH BANDWIDTH GUARANTEE**

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Abstract of the Disclosure

Load balancing enables the use of linear programming techniques to reduce the complexity of computing backup tunnel placement for guaranteed bandwidth protection.

The ability to load balance among multiple backup tunnels transforms the placement problem into one that may be characterized as a series of linear constraints usable as

10 input to a linear programming procedure such as the simplex method. Each node may compute its own backup tunnels and signal the tunnels to its neighbors with zero bandwidth to allow implicit sharing of backup bandwidth.